



DESCRIPTIONS OF AUSTRALIAN FLIES OF THE FAMILY *ASILIDAE*,
[DIPTERA] WITH SYNONYMS AND NOTES.

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In this paper synonyms are recorded, and two new species of the genus *Neoitamus* are described. Other species of the genus *Neoitamus* are given a better taxonomic treatment than has hitherto been attempted.

Australian species of the family *Asilidae* were revised by Miss Ricardo in 1912-13, but a number of descriptions were left outstanding, as the types were either missing or not in a condition suitable for recognition. Since then, considerable attention has been given to the Tasmanian *Asilidae*, chiefly by the late Arthur White, and as Tasmania is the type locality of much of the described material, it has become possible to establish the identity of many of the outstanding descriptions of species recorded from there.

Sydney is also an important type locality, but the *Asilidae* of this district require further attention and a number of common species have yet to be described. Only a few of the outstanding descriptions of species recorded from this locality, and from New South Wales generally, have been identified.

Considerable further knowledge, accumulated since Miss Ricardo's work, requires to be incorporated with a new revision founded upon a better taxonomic treatment of the species.

I am indebted to Dr. E. W. Ferguson for the loan of his collection of the genus *Neoitamus*, which contains many specimens identified by Miss Ricardo and Arthur White.

Subfamily DASYPOGONINAE.

CABASA PULCHELLA Macquart.

Dasypogon pulchellus, Macquart, Dipt. Exot., suppl. 1, 1846, p. 62, Pl. 7, fig. 9 (wing).

Cabasa pulchella, Walker, List Dipt. Brit. Mus., vi., suppl. 2, 1854, p. 499; Ricardo, Ann. Mag. Nat. Hist. (8), ix., 1912, p. 479; White, Proc. Roy. Soc. Tas., 1916, p. 155.

Dasypogon venno, Walker, List Dipt. Brit. Mus., ii., 1849, p. 359.

Cabasa venno, Walker, List Dipt. Brit. Mus., vi., suppl. 2, 1854, p. 500.

Cabasa rufithorax, Walker, Ins. Saund. Dipt., i., 1850, p. 100, Pl. iii., fig. 5; Walker, List Dipt. Brit. Mus., vi., suppl. 2, 1854, p. 499.

Dasypogon rubrithorax, Macquart, Dipt. Exot., suppl. 4, 1850, p. 66, Pl. vi., fig. 10.

Cabasa rubrithorax Ricardo, Ann. Mag. Nat. Hist. (8), ix., 1912, p. 480; White, Proc. Roy. Soc. Tas., 1916, p. 155.

Synonymy.—Miss Ricardo has identified *Cabasa rufithorax* Walker with *Cabasa pulchella* Macquart, and also *Cabasa venno* Walker with *Cabasa rubrithorax* Macquart. All the types are described from Tasmania.

A long series of Tasmanian specimens, collected by Mr. C. E. Cole, shows a complete merging of *Cabasa rubrithorax* Walker into *Cabasa pulchella* Macquart, and establishes beyond dispute this long suspected synonymy.

Hab.—Tasmania, Victoria, New South Wales and Queensland.

A specimen with semi-hyaline wings was taken at Blackheath, New South Wales, on the 27th November, 1919.

Subfamily ASILINAE.

The outlines for the classification of Australian genera of the subfamily *Asilinae* were laid down by White in 1917. White's scheme offers the only practical solution for the present treatment of Australian species of the genus *Neoitamus*, under which group he includes species placed previously in this and allied genera.

White's scheme for the classification of the *Asilinae* is accepted here for the genera. The subgenera of the genus *Neoitamus*, however, are not satisfactory, and for further remarks see under the genus *Neoitamus* below.

OMMATIUS PILOSUS White.

Ommatius pilosus, White, Proc. Roy. Soc. Tas., 1916, p. 169.

Ommatius levis, White, *ibid.*, p. 170.

The holotype of *O. levis* White is in the Australian Museum. A long series of specimens shows that this form completely merges into *O. pilosus* White, and therefore it cannot be considered distinct.

Genus NEOITAMUS Osten-Sacken.

Itamus, Loew, Lin. Ent., iv., 1849, p. 84 (preoccupied).

Neoitamus, Osten-Sacken, Cat. Dipt. N. America, edit. 2, 1878, pp. 82, 235;

Ricardo, Ann. Mag. Nat. Hist. (8), xi., 1913, p. 431; White, Proc. Roy. Soc., Tas., 1913, p. 274; 1916, p. 173; 1917, p. 91.

Under the genus *Neoitamus* a number of diverse Australian species which have a similar general appearance are grouped. The generic name is used for convenience, and the species do not necessarily conform to the description of the genus given by Loew.

When structural characters of the described species are published, and a general survey is made of the allied genera of the world, it will become possible to give this group of Asilids an adequate treatment for generic and subgeneric division.

White proposed the three following subgenera:—*Trichoitamus* White (type, *Dysmachus rudis* Walk.), *Neoitamus* Loew (type, *N. cyanurus* Loew), and *Rhabdotoitamus* White (type, *N. brunneus* White).

Neoitamus cyanurus Loew is a European species.

The type species of *Rhabdotoitamus* was not fixed by White, but *R. brunneus* White (= *N. vittipes* Macquart) conforms best to the subgenus as White described it, and also it has the advantage of being widely distributed and common.

In the present paper the species are dealt with as belonging to one genus *Neoitamus*, so as to avoid the confusion that would otherwise arise, due to the species being placed in arbitrary subgenera that have unsatisfactory or even no structural differences; and, moreover, the collection shows a number of species that could be divided into subgenera, or even genera, upon apparently sound structural characters. It is premature, however, to subdivide the genus until adequate study has been made of all the described forms.

The exoskeleton shows differences of specific value in the characters discussed below.

Head.—On the face there is a tubercle varying in size in the different species, and on this is situated the moustache which varies in density approximately in relation to the size of the tubercle. *N. claripes* White, *N. volaticus* White, and *N. australis* Ricardo have a very small tubercle and moustache, whilst the other species have these characters generally much more pronounced.

A row of bristles is situated behind the eyes in most of the species, but in a few apparently undescribed forms they are absent. Some species have these bristles arranged in two rows or more.

Thorax.—The presutural bristles are those lateral bristles situated anterior to the transverse suture; they are always two in number close to the suture, and anterior to these there are sometimes one or more further bristles.

The supalar bristles are those situated above the wings, between the transverse suture and the postalar callus. They may be one, two, or three in number, rarely more.

The postalar bristles are those situated on the postalar callus, and may be from one to four in number.

The dorsocentral bristles are confined to two rows on the dorsum placed on each side of, at some little distance from, and parallel to the median line. These bristles are usually regularly placed and alternate with a row of hairs placed in a closely adjacent or a contiguous line; if one of the bristles is suppressed or obsolete, the hair on each side of it becomes much stronger and bristle-like. When counting, allowance must be made for these suppressed bristles, but sometimes specimens will be found too irregular for the alternating hair and bristle character to be seen.

As these dorsal thoracic bristles appear to have a definite limit of variation in each species, they afford important characters for identifying female specimens.

The metapleural bristles are situated below the halteres; these are erect and are arranged in a vertical line. Below, above the hind coxae, and continuing in the same line, are also erect hypopleural bristles. The metapleural bristles are invariably present, but sometimes the hypopleural bristles are reduced to depressed hairs, or are completely missing. Both sets of bristles are very thin and hair-like, but as they stand erect on an otherwise bare surface they are very conspicuous.

Scutellum. The scutellar bristles are situated on the margin of the scutellum, and are from two to six, rarely more, in number.

Abdomen. A row of bristles may be present on most of the abdominal segments. These bristles are generally in a complete line on the first segment, but are interrupted by a bare space on the dorsum of the other segments; they are placed parallel and anterior to the posterior margins; they are smallest towards the centre, and become longer laterally, where they are often erect and conspicuous.

Legs. The femur is more or less oval in cross section, and when the legs are at right angles to the thorax, that flattened surface which faces towards the head is known as the anterior side; the other three sides are called the dorsal, posterior and ventral sides.

The anterior femur is generally spineless, but occasionally a spine is to be found towards the apex of the posterior side, and *N. armatus* Macquart has four spines on the ventral side.

A complement of spines on the intermediate femur appears to consist of a

row on the anterior side, one subapical spine on the posterior side, and a ventral row. The row on the anterior side may vary in the number of spines, and may even be reduced to one or two; this row often runs on to the dorsum, and, in such a case, if the last spine is isolated with a bare space between it and the other remaining spines, it will appear to be a subapical dorsal spine.

A complement of spines on the posterior femur consists of two rows on the anterior side and one ventral row. Besides these there are a few subapical spines.

In a long series of specimens a wide range of variation will generally be found, but in a few species the variation is limited.

Wings. The wings are hyaline, or more or less tinted with fuscous, and fuscous spots are present in a few species. The venation is constant with regard to the veins and cells, but slight variations occur in the relative shape and length of some of the cells.

Male genitalia. The exposed genital forceps of the male afford the only satisfactory characters for identifying a species. This organ has a wonderful variety of characters that have been all but overlooked by earlier authors, and it is the purpose of the present paper to utilise them as the main objective for establishing species. The females in such a system of classification are, necessarily, of secondary consideration; nevertheless, they can generally be identified by other characters by comparison with their respective males.

The male genitalia contain a pair of upper forceps, between the two branches of which is situated the dorsal median lamella, and a pair of lower forceps—in all, five visible parts.

The upper forceps vary considerably in shape in the various species, and may contain a terminal process, or may be simple and without a process, and, finally, may contain bristles.

The genitalia of *A. exilis* Macquart, *A. filiferus* Macquart and *Cerdistus australis* Ricardo are described as having bristles.

Female ovipositor. Few descriptions convey any real idea of the length of the ovipositor, yet sometimes females of closely related species can be separated by the comparative length of this organ. White refers to the ovipositor as being long in all his species except *N. abditus*, where, he states in the original description, it is rather short, and in 1917 he refers to it as unusually short. This species, however, has a very distinctive ovipositor, and, on the strength of this organ, it should be placed in a separate genus; it is somewhat compressed ventrally, but has a conspicuous dorsal surface which decreases posteriorly, and at the apex there is a pair of small, separated, conical lamellae. All the other species in the collection contain one, more or less cylindrical, styliiform lamella at the apex of the eighth abdominal segment which is usually entirely compressed. Sometimes the seventh abdominal segment is black, shining, and compressed on the dorsal surface, but shows a ventral area; this character is called *subcompressed* in the descriptions given below. In two species, one described below as new, the sixth abdominal segment is also black, shining and subcompressed.

Both White and Miss Ricardo refer to these subcompressed segments as forming part of the female ovipositor, but as gradations in the various species make the line of demarcation difficult to determine, it is not advisable to interpret the character in that manner.

There are forty-seven specific names, all of which probably belong to the group of species here classed as the genus *Neoitamus*, and in this paper twenty of these names are distributed among twelve species, and two new specific names are proposed. Twenty-seven further specific names require more adequate description than has yet been given to them; these, under their respective authors, are given in the following list:—

Macquart: *Asilus acutangulatus*, *A. australis*, *A. exilis*, *A. feriferus*, *A. fulvipubescent*, *A. longiventris*, *A. nigrinus*, *A. rufocoxatus*, *A. rufometatarsis*, *A. varifemoratus* and finally *A. laticornis*, which does not conform to any known species, and Miss Ricardo states that the ovipositor is short and conical.

Walker: *Asilus coedicius*, *A. elicitus*, *A. maricus*, *A. obumbratus*, *A. cilicatus* and *Dysmachus rudis*.

Schiner: *Glaphyropyga australiasiae*.

Ricardo: *Cerdistus australis* and *Neoitamus australis* (both of which specific names are preoccupied by Macquart's *A. australis*), *N. gibbonsi* and *N. hyalipennis*; the species described as *N. hyalipennis* by White may not be identical with Miss Ricardo's species.

White: *Neoitamus divaricatus*, *Rhabdotoitamus lautus*, *R. lividus*, *R. rusticus* and *R. volaticus*.

There are four other outstanding descriptions belonging to the *Asilinae* and, judging from the described characters, they cannot belong to the group dealt with here. These must be retained in the *Asilus* group *sensu lato*, and are as follows:—*Asilus ferrugineiventris* Macquart, *A. alligans* Walker, *A. belzebulb* Wiedemann and *A. regius* Jaennicke.

Asilus crabroniformis Meigen is cancelled from the Australian list. This is a well known European species that was erroneously recorded from Tasmania by Macquart in 1847.

Key to the species of the genus *Neoitamus* described below, of which both sexes are known.

1. The female ovipositor short, with two small separated lamellae. Male genitalia without an apical process. Two super- and one post-alar bristles

abditus White.

The female ovipositor with one styliform lamella. Male genitalia with or without an apical process 2.

2. The upper forceps of the male genitalia with a terminal process 3.
- The upper forceps of the male genitalia without a terminal process 6.

3. The male genitalia short and globular, the apical process is above the centre of and more or less at right angles to, the outer margin. Female ovipositor short. Two super- and three post-alar bristles *sydneyensis* Schiner.

The male genitalia elongate, the apical process rarely at right angles to the apical border; if at right angles, it is situated below the centre of the apical border 4.

4. The seventh segment of the female abdomen black, shining and subcompressed, and as long as the moderately long ovipositor. Seen laterally, the apical half of the male genitalia is more swollen than the basal half. Super- and post-alar bristles three each (?) *flavicinctus* White.

The seventh segment of the female abdomen normal. Seen laterally, the apical half of the male genitalia is not swollen. Female ovipositor short 5.

5. The dorsal and ventral surfaces of the male genitalia are more or less parallel. Super- and post-alar bristles two each *fraternus* Macquart.

The dorsal and ventral surfaces of the male genitalia taper towards the apex which is truncate. Two super- and one, rarely two, post-alar bristles

vittipes Macquart.

6. The male genitalia with bristles 9.

The male genitalia without bristles 7.

7. The anterior femora with a conspicuous row of ventral spines. Female ovipositor very long. Two super-, one, rarely two, post-alar bristles

armatus Macquart.

The anterior femora without ventral spines. Female ovipositor short 8.

8. The female ovipositor entirely compressed. Super- and post-alar bristles one each

claripes White.

The female ovipositor compressed ventrally, but with a dorsal surface. Two super- and one or two post-alar bristles *maculatoides*, n.sp.

9. The upper forceps of the male genitalia with a row of about ten slender dorsal bristles. Female ovipositor short. Two super-, one or two post-alar and two scutellar bristles *marginatus* Walker.

The upper forceps of the male genitalia with one long, ventral, subapical bristle, and a row of ventral bristles on the lower forceps. The female ovipositor is short, and the sixth and seventh abdominal segments of the female are sub-compressed, black and shining. Two or three superalar, three or four postalar and four scutellar bristles *setosus*, n.sp.

NEOITAMUS ABDITUS White. (Text-figs. 1-3.)

Neoitamus abditus, White, Proc. Roy. Soc. Tas., 1916, p. 178, text-fig. 29 (wing); and 1917, p. 93 (in key).

Synonymy. Outstanding descriptions of the *Asilinae* are not sufficient for *N. abditus* White to be identified as one of them, but it is possible that *A. acutangulatus* Macquart may belong here.

Description. The species will be readily recognised by the small separated lamellae of the female ovipositor.

♂. The face has a large tubercle containing black hairs which increase in length towards the centre; the centre of the tubercle contains six, shorter, black bristles; below these bristles there are slender white hairs which are sometimes bordered laterally by a row of very fine black hairs. Behind the eyes there is a row of black bristles.

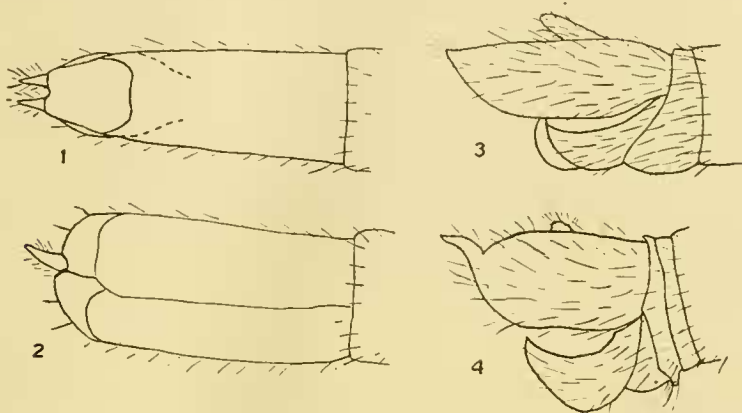
The dorsal bristles of the thorax are disposed on each side of the median line as follows:—two presutural; two superalar, one of which is weak; one post-alar; about six dorso-central, between each of which there is a thin bristle-like hair.

The hypopleural and metapleural bristles are present, and the scutellar bristles are two or four in number. All the bristles of the thorax and scutellum are black.

The bristles towards the apex of the abdominal segments are mostly white, but black bristles occur on the posterior segments. The second to fifth segments have two conspicuous, erect, lateral white bristles. The upper forceps of the male genitalia are simple and moderately hairy; seen laterally, they are more or less parallel-sided.

The legs have the anterior femora without spines; the intermediate femora have a row of spines on the anterior side, but this row is often reduced in number to two spines; the subapical spine on the posterior side is present; the posterior femora have only one row of spines present on the anterior side; there is one subapical dorsal spine and a ventral row of spines.

The wings have a normal venation; the intermediate crossvein is situated about the middle of the discal cell; the second posterior cell is long and considerably constricted subapically.



Text-figs. 1-3.—*Neoitamus abditus*. 1, female ovipositor seen dorsally; 2, the same seen laterally; 3, the male genitalia seen laterally. (x 25).

Text-fig. 4.—*Neoitamus sydneyensis*. The male genitalia. (x 25).

♀. The female differs from the male in having the abdominal bristles obsolete. The ovipositor is short, compressed ventrally only, the dorsal portion tapering apically and terminating in a pair of small, more or less conical, separated lamellae.

Hab.—Tasmania and Victoria. (February to April.)

Type.—White only described the female of this species. The holotype female was purchased by the British Museum with White's collection. The allotype male, described above, is in the Australian Museum. There are five paratype males.

Note.—The collection under revision contains six males and seven females. One of the females was originally identified by White, and two pairs were taken in copula at Hobart and Melbourne respectively, thus establishing the sex relationship. All the specimens were taken by the writer.

NEOITAMUS SYDNEYENSIS Schiner. (Text-fig. 4.)

Cerdistus sydneyensis, Schiner, Reise Novara, Dipt., 1868, p. 187; Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 436; and (9), i., 1918, p. 63.

Description. ♂. The face has a moderately large tubercle; the moustache is composed of stiff black bristles, with black hairs above and on each side; below, there are longer white hairs bordered laterally by a row of very fine black hairs. There is a row of black bristles behind the eyes.

The dorsal bristles of the thorax are disposed on each side of the median line as follows:—two presutural; two superalar; three postalar, composed of one long bristle in the centre and one hair-like bristle on each side of it; four to six dorsocentral; all the above bristles are black. The metapleural bristles are black and the hypopleural bristles are usually white. There are two black scutellar bristles.

The abdominal bristles are long, mostly black, and very pronounced as far as the fifth segment. The upper forceps of the male genitalia are short, and have a process situated slightly above the middle of the outer border and turning at right angles to it.

The legs have the anterior femora without spines; the intermediate femora have the system of spines more or less complete, but the spines on the anterior sides are usually reduced to two or three; the posterior femora have a complete system of bristles but the upper row on the anterior side is reduced in number. The bristle system is explained in the introduction.

The wings have a normal venation. The intermediate crossvein is situated about the middle of the discal cell and, beyond this vein, there is a conspicuous hyaline area. The second posterior cell is short and normal.

♀. The female is similar to the male. The ovipositor is short, compressed, and contains a cylindrical styloform lamella.

Hab.—New South Wales: Sydney, Milson Island, Palm-beach, and Blackheath. (October to December.)

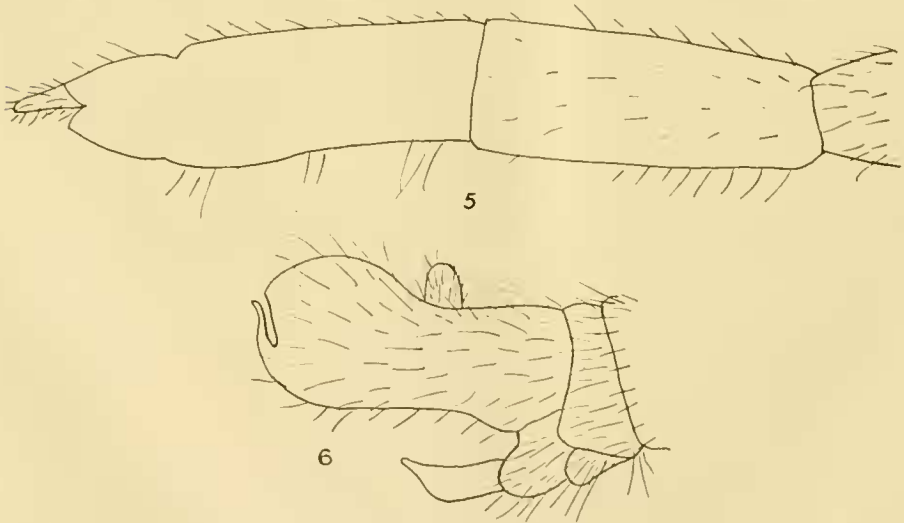
Note.—In the collections under revision, there are seventeen males and fifteen females. One of the females is labelled *Cerdistus sydneyensis* Schiner in Miss Ricardo's handwriting

NEOITAMUS FLAVICINCTUS White. (Text-figs. 5, 6.)

Neoitamus flavicinctus, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 275; 1916, p. 174; 1917, p. 92 (in key).

Description. ♂. The face has a large tubercle and a black moustache. There is a row of black bristles behind the eyes.

The thorax has abundant black bristles which extend towards the anterior margin, gradually diminishing in size. Besides the usual two presutural, there are four more bristles situated between the humeral angle and the transverse suture. Above the wings there are three or four bristles, referred to here as the



Text-figs. 5-6. *Neoitamus flavicinctus*. 5, female ovipositor; 6, male genitalia. (x 25).

supalarar. The postalar bristles are three in number, and the dorsocentral bristles are represented by a complete line of mixed hairs and bristles that do not conform to the usual alternating hair and bristle order. The scutellum has six marginal bristles. All the bristles, including the hypopleural and metapleural, are black.

The bristles on the abdomen are long and mostly white; they are very prominent as far as the fifth segment. The upper forceps of the male genitalia are long, and seen laterally the apical half is swollen, and terminates in a digitate process which branches about the middle of the apical border.

The legs have the anterior femora without spines; the intermediate femora have, besides the complete system of spines, a second row of spines on the anterior side. The posterior femora have a complete system of spines. These spine systems are explained in the introduction.

The wings have a normal venation; the intermediate crossvein is situated at about half the length of the discal cell; the second posterior cell is rather long and slightly constricted subapically.

♀. The female appears to be similar to the male, but the bristles are somewhat flattened and broken. The sixth abdominal segment is partly bare of tomentum, and appears to be slightly compressed. The seventh abdominal segment is sub-compressed, bare and shining, and as long as the moderately long ovipositor which has a terminal style-like lamella.

Hab.—Tasmania: Cradle Mt. (January, 1917. 1 male. 1 female.)

Note.—The collection under revision contains only two specimens that can be referred to this rare species. The identification is probably correct, as the specimens agree entirely with White's description. The female ovipositor (text-fig. 5) is drawn as it appears on the insect, and it seems probable that the sixth abdominal segment is distorted at the apex.

NEOITAMUS FRATERNUS Macquart. (Text-figs. 7 and 8.)

Asilus fraternus, Macquart, Dipt. Exot., suppl. 1, 1846, p. 91; Walker, List Dipt. Brit. Mus., vii., suppl. 3, 1855, p. 738; White, Proc. Roy. Soc. Tas., 1913, pp. 274 (in key) and 275.

Asilus luctificus, Walker, Ins. Saund. Dipt., i., 1851, p. 144; Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 447.

Neoitamus varius, Ricardo (*nec* Walker), Ann. Mag. Nat. Hist., (8), xi., 1913, p. 431 (part).

Neoitamus vulgatus, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 276; 1916, p. 177, text-fig. 28 (wing); 1917, p. 93 (in key).

Synonymy. The types of *A. fraternus* Macquart, *A. luctificus* Walker, and *N. vulgatus* White are from Tasmania. Miss Ricardo placed *A. fraternus*, female as a synonym of *N. varius* Walker, a New Zealand species, but this is probably not correct. Miss Ricardo also suggests that *A. luctificus* Walker should be expunged from the list of species as the type is lost, but the description conforms well with this common Tasmanian species.

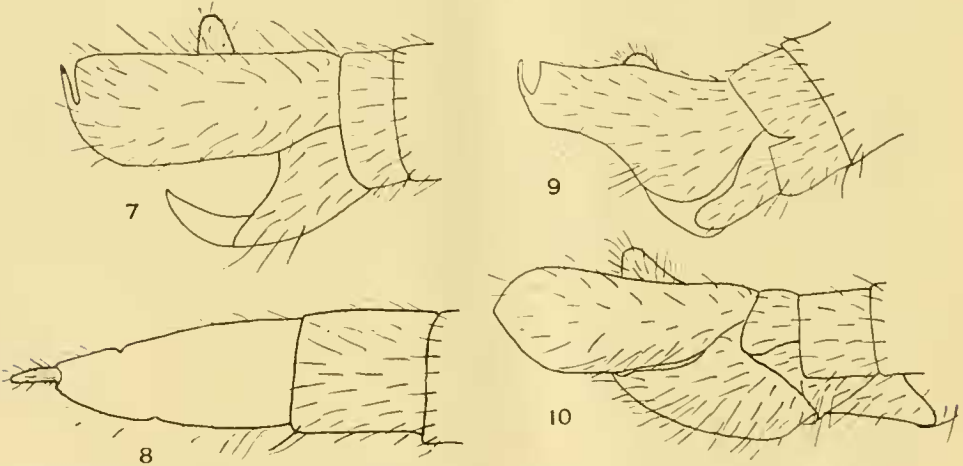
According to his key characters, White took his description of *N. fraternus* Macquart from Miss Ricardo's description of *N. varius* Walker, and he further states that he did not meet with any species agreeing with Macquart's description. It is possible, however, that White did not refer to Macquart's description, as there is not a copy of Macquart's "Diptères exotique" in Tasmania, and moreover, if he had had access to this work, he would not have overlooked so many species of Diptera described from Tasmania.

In the collection under revision, there is a male eotype of *N. vulgatus* White, and this is identical with a male of a pair taken in copula, and thus establishes the sex relationship; the female has a short ovipositor, not long, as stated by White in his description.

New South Wales specimens identified by White, and represented by various specimens in the collection under revision, have longer ovipositors, and therefore *N. vulgatus* var. White cannot belong to the same species, and, moreover, *N. vulgatus* White is only known from Tasmania, although White's description covers more than one species occurring on the mainland of Australia.

Description. ♂. The tubercle of the face is large, and the moustache consists of white hairs below, and black hairs above; sometimes there is a lateral row of small black hairs bordering the white hairs. Behind the eyes there is a row of black bristles.

The dorsal thoracic bristles are disposed on each side of the median line as follows:—two presutural, two supalar and two postalar, and, besides these, there may be one or two extra presutural and supalar bristles present, and also an extra postalar bristle; about six dorsocentral bristles alternating with black hairs; all bristles black. The two scutellar and the metapleural bristles are black, the hypopleural bristles are mostly white.



Text-figs. 7-8.—*Neoitamus fraternus*.
7, male genitalia; 8, female ovipositor. (x 25).

Text-fig. 9.—*Neoitamus vittipes*,
male genitalia. (x 25).

Text-fig. 10.—*Neoitamus armatus*,
male genitalia. (x 25).

The bristles of the abdominal segments are mostly white, and there are two erect, white, lateral bristles on the second to fifth segments. The upper forceps of the male genitalia are elongate, and have a digitate apical process which branches about the middle of the apical border; seen laterally they are more or less parallel-sided.

The legs have the anterior femora without spines; the intermediate and posterior femora have the system of spines more or less complete; these spine systems are explained in the introduction.

The wings have a normal venation; the intermediate crossvein is situated at about half the length of the discal cell, and the second posterior cell is short.

♀. The female is similar to the male and the ovipositor is short.

Hab.—Tasmania.

Note.—The collection under revision contains twenty males and eighteen females, all Tasmanian. Other specimens, labelled *N. vulgatus* by White belong to widely different species, and are dealt with under their respective names.

NEOITAMUS VITTIPES Macquart. (Text-fig. 9.)

Asilus vittipes, Macquart, Dipt. Exot., suppl. 2, 1847, p. 43; Walker, List Dipt. Brit. Mus., vii., suppl. 3, 1855, p. 741.

Asilus cognatus, Macquart, Dipt. Exot., suppl. 4, 1850, p. 94.

Asilus alicis, Walker, List., Dipt. Brit. Mus., vii., suppl. 3, 1855, p. 738.

Neoitamus brunneus, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 279, 1916, p. 180.

Rhabdotoitamus brunneus, White, Proc. Roy. Soc. Tas., 1917, p. 100.

Synonymy. Macquart's types of *A. vittipes* and *A. cognatus* are from Tasmania, and their descriptions conform to two colour forms of White's variable species, *N. brunneus*, which is the genotype of the subgenus *Rhabdotoitamus*.

Walker's type of *A. alicis*, from Australia, is recorded as lost by Miss Ricardo, and was therefore placed by her amongst the species she proposed to cancel from the list, but the description conforms to Australian specimens of White's genotype, and in this way establishes its probable identity with *A. vittipes* Macquart.

Description. ♂. The moustache is white, and occupies a moderately large tubercle; occasionally there are one or two black hairs above. There is a row of white bristles behind the eyes.

The dorsal thoracic bristles are disposed on each side of the median line as follows:—two presutural, two superalar, one, rarely two, postalar, and about four dorsocentral; all the bristles black. There are two black scutellar bristles, and the metapleural and hypopleural bristles are white.

Both sides of each abdominal segment from the second to the fifth contain two long, erect, white bristles; the other abdominal bristles are black.

The upper forceps of the male genitalia are short, tapering apically, and terminating in a digitate process which branches from the ventral posterior angle. The upper and lower forceps are reddish-brown in colour, and are partly darkened with fuscous.

The legs have the anterior femora without spines; the intermediate and posterior femora have their system of spines more or less complete.

The wings have a normal venation; the intermediate crossvein is situated at a little beyond the middle of the discal cell, and the second posterior cell is short.

♀. The female is similar to the male; the ovipositor is short.

Hab.—Tasmania, Victoria, and New South Wales. (January to March.)

Note.—The collection under revision contains thirteen specimens, four males and one female from Tasmania, three males and four females from New South Wales, and one male without locality. A female from Sydney was labelled by White as his *N. brunneus*.

NEOITAMUS ARMATUS Macquart. (Text-fig. 10.)

Asilus armatus, Macquart, Dipt. Exot., suppl. 1, 1846, p. 91, Pl. 8, fig. 17; Walker, List Dipt. Brit. Mus., vii., suppl. 3, 1855, p. 737.

Asilus setifemoratus, Macquart, Dipt. Exot., suppl. 5, 1854, p. 65.

Asilus antileo, Walker, List Dipt. Brit. Mus. ii., 1849, p. 458; vii., suppl. 3, 1855, p. 737.

Machimus antileo, Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 423.

Itamus planiceps, Schiner, Reise Novara, Dipt., 1868, p. 189.

Neoitamus planiceps, Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 434; White, Proc. Roy. Soc. Tas., 1913, p. 275.

Synonymy.—*Asilus armatus* Macquart is described from Tasmania, but Walker gives Australia and Tasmania for Macquart's species. *A. setifemorata* Macquart is from Adelaide. *A. antileo* Walker is from Port Stephens. *N. planiceps* Schiner is from Sydney. In the collection under revision there are specimens from Sydney and Tasmania which cannot be separated from each other or from the various descriptions.

In describing *I. planiceps*, Schiner states that his species does not agree with the descriptions of Macquart's *A. setifemorata* and *A. rufotarsis*; Schiner's description, however, appears to agree with *A. setifemorata* in spite of his statement to the contrary.

The reference to *A. rufotarsis* Macquart is not traceable; *A. rufometatarsis* Macquart is not described as having spines on the anterior femora, and therefore *A. rufotarsis* evidently is not a misprint for that name.

In describing the male genitalia, Schiner states that the posterior border is serrated; as this does not conform to the illustration of the male genitalia given here, it is necessary to point out that when the two obtuse points, one at the apex of each branch of the upper forceps, are seen laterally, one above the other, the posterior border of the genitalia has a bi-toothed serration.

A. armata Macquart is described with, and the drawing shows, four ventral spines on the anterior femora. There can be little doubt but that the Tasmanian specimens in the collection belong to this species, and specimens from Sydney are identical, making *I. planiceps* Schiner an undoubted synonym.

A. setifemorata Macquart and *A. antileo* Walker, from their descriptions, are referable here.

Description. ♂ The tubercle of the face is large; the moustache is mostly black, but there are about six white bristles in the centre. There is a row of black bristles behind the eyes.

The dorsal thoracic bristles are disposed each side of the median line as follows:—two presutural; two superalar; one postalar, but sometimes a second, very thin, postalar bristle is also present; about six dorsocentral; all these bristles black.

There are two black scutellar bristles. The metapleural bristles are black or white, and the hypopleural bristles are white and not very prominent.

The abdominal bristles are mostly white. The upper forceps of the male genitalia are simple, and without a process; they broaden apically, and the posterior margin is obliquely angled or rounded.

The anterior femora have four conspicuous, thick, black, ventral spines; the intermediate and posterior femora have their respective spine systems sometimes complete, but the rows generally have a reduced number of spines.

The wings have a normal venation; the intermediate crossvein is situated at nearly two-thirds the length of the discal cell, and the second posterior cell is long and slightly constricted subapically.

♀. The female is similar to the male, but the moustache and abdominal spines are very variable in colour. The ovipositor is very long and ribbon-like.

Hab.—New South Wales and Tasmania. (October to January, April.)

Note.—In the collection under revision there are twenty specimens; two males and eight females from Sydney, one female from Milson Island which is labelled by White as his *N. vulgatus*; two males and four females, in the Macleay Museum, from New South Wales, and three females from Tasmania, one of which was taken in April.

Becker* described a species from British East Africa under the name *N. armatus*. This appears to be a true *Neoitamus* for which a new specific name will be required if Macquart's species, described above, is allowed to remain within this genus.

NEOITAMUS CLARIPES White. (Text-fig. 11.)

Rhabdotoitamus claripes, White, Proc. Roy. Soc. Tas., 1917 (1918), p. 98.

Description. ♂. The face has a small tubercle. The moustache is small, and composed of about twenty bristles and hairs. There is a row of small, thin, yellowish bristles behind the eyes.

The dorsal thoracic bristles are disposed on each side of the median line as follows:—one black, a second yellow or black, presutural; one yellow, rarely black, superalar and sometimes a second yellow or black bristle is present; from two to five dorsocentral, of which the two posterior are always yellow, the others, if present, are black. There are two yellow scutellar bristles; the metapleural bristles are yellow, and the hypopleural bristles are suppressed.

The abdominal bristles are mostly black on the first segment, and long, prominent and yellow on the second to fifth segments. The upper forceps of the male genitalia are rather long, and thin; they curve upwards apically, and are without a process.

The legs have the anterior femora without spines; the intermediate femora with only three spines, one of which is placed about one-third and the second about two-thirds the length of the anterior side; the third is placed subapically on the posterior side; the posterior femora have the spines on the anterior side reduced to two or three representing the lower row, and one or two representing the upper row; there is a complete ventral row, but the spines are often reduced in size to bristles.

The wings have a normal venation; the intermediate crossvein is situated a little beyond the middle of the discal cell, the second posterior cell is long and slightly constricted subapically.

♀. The female is similar to the male, and the ovipositor is rather short.

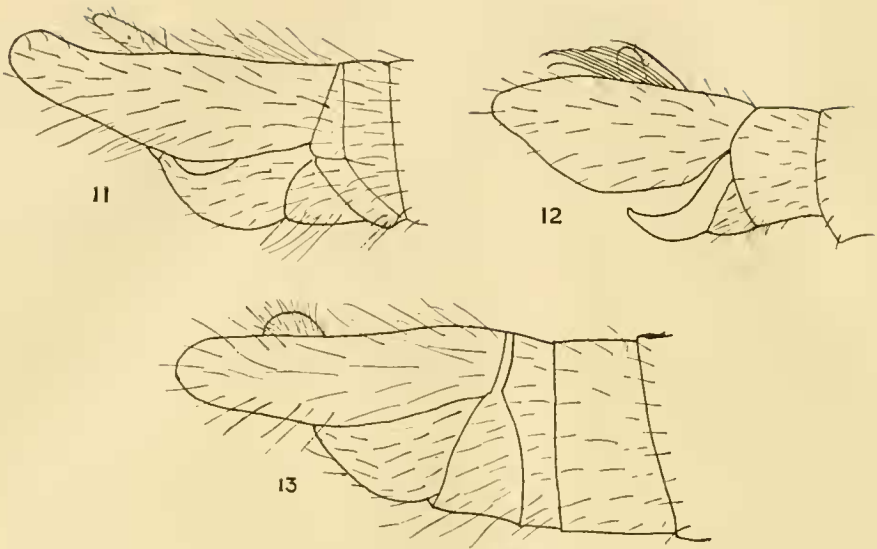
Hab.—New South Wales: Sydney and Blackheath.

Note.—The collection under revision contains nine males and eleven females from Blackheath, taken from the 14th to the 25th November, 1919, and one female from Sydney taken on the 30th March, 1919; there are also two females from New South Wales in the Macleay Museum. They agree in every respect with White's description.

NEOITAMUS MACULATOIDES, n.sp. (Text-fig. 13.)

Description. A black species with a superficial resemblance to *N. maculata* White, but the female ovipositor is shorter and only slightly compressed. There is no description amongst the Australian species of *Neoitamus* that can in any way be associated with this species.

*Bull. Mus. Paris, 1909, p. 144, and Ann. Soc. Ent. France, lxxix., 1910, p.22.

Text-fig. 11.—*Neoitamus claripes*, male genitalia. (x 25).Text-fig. 12.—*Neoitamus margiles*, male genitalia. (x 25).Text-fig. 13.—*Neoitamus maculatooides*, n.sp., male genitalia. (x 25).

♂. The front, face and most of the tubercle are brownish; from the oral margin to behind the eyes, the head is covered with a light grey tomentum. The hair on the front is black. The tubercle is large, and contains a large moustache of mostly black hairs, but at the oral margin the hairs are white. The beard is white. There is apparently a double row of bristles behind the eyes. The antennae are black, the first joint is twice the length of the second, the third is elongate and tapering, and without any apparent differentiated style, and this is longer than twice the length of the two basal joints united. The eyes, proboscis and palpi are black, the latter has white hairs.

The thorax is black, with traces of four darker, thin, median stripes and light grey tomentum stripes and spots. The dorsal thoracic bristles are disposed each side of the median as follows:—two presutural; two superalar; two postalar; and about seven dorsocentral. There are also numerous bristle-like hairs on the dorsum. All the bristles including the two scutellar, the metapleural and hypopleural are black. The hairs on the thorax are mostly black, but there are long, thin, white hairs posteriorly and on the shoulder tubercles.

The abdomen is black, with the incisions and sides dark grey. The hair above and below is white. The bristles are long, black and prominent as far as the sixth segment. The upper forceps of the male genitalia are long, narrow and without a process.

The legs have the anterior femora without spines, and the intermediate and posterior femora with their respective spine systems more or less complete.

The wings have a normal venation: the intermediate crossvein is situated a little beyond the discal cell, and the second posterior cell is short. The lower branch of the cubital fork is rather strongly curved upwards, and there are fuscous spots situated at the usual positions, one each at the apices of the mar-

ginal, first and second posterior, and the discal cells, and also one at the cubital fork.

♀. The female is similar to the male; the ovipositor is very short and only subcompressed; it shows a ventral surface as linear, but the dorsal surface is convex and tapers apically and in transverse section a "V" is formed by the two sides.

Length.—Male, 14 mm.; female, 18 mm.

Hab.—New South Wales: Sydney; holotype male and allotype female, 31st March, 1918; one paratype male, 29th March, 1918.

Type.—The holotype and paratype are in the Australian Museum.

NEOITAMUS MARGITES Walker. (Text-fig. 12.)

Asilus margites, Walker, List Dipt. Brit. Mus., ii., 1849, p. 461; vii., suppl. 3, 1855, p. 737; Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 448.

Neoitamus caliginosus, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 277; 1916, p. 176; 1917, p. 93 (in key).

Synonymy.—Walker's type is from Melbourne, and White's type is from Tasmania. In the collection under revision there are specimens from Sydney identified by White as his *N. caliginosus*; these agree with the Tasmanian specimens, and also with Walker's description of *A. margites*.

Description. ♂. The face has a large tubercle, and a moustache composed of mostly white hairs. There is a row of black bristles behind the eyes.

The dorsal thoracic bristles are disposed on each side of the median as follows:—two presutural; two superalar; one postalar; five dorsocentral. The number of bristles appears to be constant, and normally they are black. There are two scutellar bristles which are normally black, but often one or both are white. The metapleural bristles are black and the hypopleural bristles are white and weak or obsolete.

The abdominal bristles are mostly black, small and not very conspicuous. The upper forceps of the male genitalia are simple and without a process, but they have a row of about ten long, slender, dorsal bristles which somewhat conceal the median lamella.

The legs have the anterior femora without spines; the intermediate femora with the row on the anterior side usually reduced to two spines, a subapical spine on the posterior side, and the ventral row of spines complete; the posterior femora with the system of spines complete.

The wings have a normal venation; the intermediate crossvein is situated about the middle of the discal cell, and the second posterior cell is short. Sometimes fuscous spots are present on the wing.

♀. The female is similar to the male and generally has a few black hairs above the white in the moustache; the ovipositor is short.

Hab.—Tasmania and New South Wales.

Note.—In the collection under revision there are twenty-five specimens; three males and four females from Tasmania, and five males and thirteen females from New South Wales. One female from Sydney and one from the Hawkesbury River are labelled by White as his *N. caliginosus*.

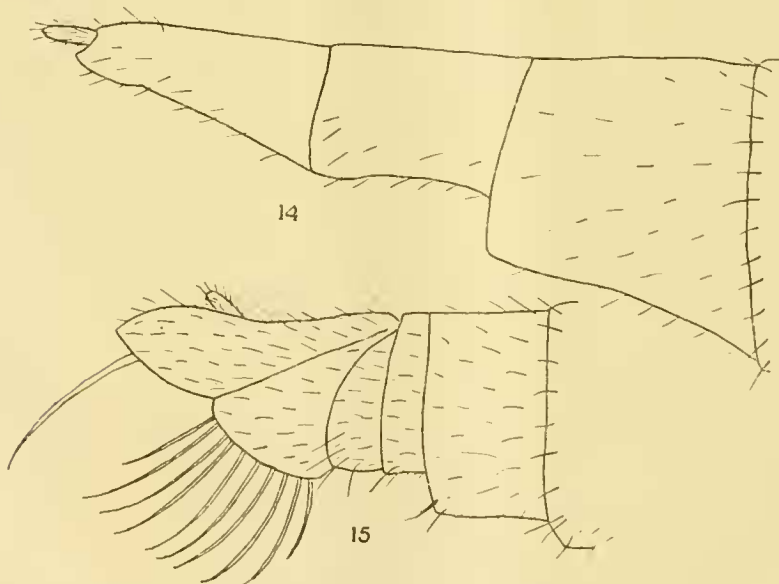
NEOITAMUS SETOSUS, n.sp. (Text-figs. 14, 15.)

Description. ♂. The tubercle of the face is large, the moustache is mostly white, and the hairs above and laterally are black. The front is black, covered

with grey tomentum, and contains some long black hairs on the ocelli; these hairs extend in two rows parallel to the eyes. The antennae are black; the first joint contains some short black bristles and some long black ventral hairs; the second segment is half the length of the first and contains some short black bristles; the third segment is as long as the second and tapers into an apparently unjointed arista, the whole length of the joint and arista is slightly longer than the two basal joints united. The proboscis is black, and the palpi are black with black hairs. The beard is white. Behind the eyes there is a double row of black bristles.

The thoracic markings are of the usual form containing a pair of median stripes and an interrupted lateral stripe on each side. The dorsal thoracic bristles are disposed on each side of the median as follows:—two presutural; two, rarely three, superalar; three, rarely four, postalar; seven dorsocentral. All these bristles, the four scutellar bristles, the metapleural and hypopleural bristles are black. The thorax ventrally is covered with grey tomentum and white hairs.

The abdominal bristles are yellowish, long, and conspicuous from the third to the sixth segments only. The segments are black dorsally, with mostly black hairs; the incisions, sides and ventre are grey, with grey tomentum and long yellowish hairs. The upper forceps of the male genitalia widen apically, and each branch has a long, strong, ventral bristle placed subapically, and anteriorly to these there are a few long hairs. The lower forceps have a row of eight ventral bristles each; the first and eighth bristles are weakest.



Text-figs. 14-15.—*Neoilamus setosus*, n.sp. 14, female ovipositor;
15, male genitalia. (x 25).

The legs have the coxae covered with grey tomentum and hairs, and the intermediate coxae have two black bristles; the femora are black with white pubescence. The anterior femora are without spines; the intermediate and posterior femora have their respective system of spines more or less complete.

The tibiae are reddish with the apical fifth black, all bristles black. The tarsi are black, with black bristles and reddish pubescence beneath.

The wings are slightly infumed and have a normal venation; the intermediate crossvein is situated before the middle of the discal cell and the second posterior cell is rather long and slightly constricted subapically.

♀. The female is similar to the male; the abdominal bristles are smaller; the ovipositor is short, and contains a cylindrical styliiform lamella. The sixth and seventh abdominal segments are black, shining and subcompressed; sometimes the seventh segment is quite compressed, and both the sixth and seventh segments are as long as the ovipositor.

Length.—Males, 15–16 mm.; females, 13–19 mm.

Hab.—New South Wales: Sydney and Katoomba. (November to January.)

Type.—The holotype male and the allotype female were presented to the Australian Museum by Dr. E. W. Ferguson. They were taken in Sydney, at Roseville, on the 17th and 8th November, 1919, respectively. There are eleven paratypes, four males and three females from the type locality, also taken by Dr. Ferguson; one male taken at Katoomba during 1912, by Mr. E. Green, a pair taken by Mr. F. H. Taylor in Sydney, and one in the Macleay Museum.

Note.—This species cannot be made to agree with any description so far published. *A. exilis* Macquart has bristles on the apex of the male genitalia, but differs according to its description in several respects and is from Kangaroo Island. *Asilus villaticus* Walker from New South Wales, and *Cerdistus australis* Ricardo also do not conform to this species, although the latter, and probably the former, have bristles on the male genitalia. The females of both these are known to Miss Ricardo, and it is taken for granted that no species known to that author has the sixth abdominal segment of the female ovipositor-like. Both Miss Ricardo and White state that the sixth abdominal segment does not form part of the ovipositor in Australian species. *Asilus filiferus* Macquart, from Sydney Island, has also filaments to the male genitalia, but Macquart's drawing of this organ differs considerably from that of the species described above.

NEOITAMUS MACULATUS White. (Text-fig. 16.)

Neoitamus maculatus, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 278; 1917, p. 93 (in key).

Description ♀. The face has a large tubercle; the moustache is composed chiefly of long black hairs, but there are white hairs along the oral margin. There appears to be a double row of black bristles behind the eyes.



Text-fig. 16.—*Neoitamus maculatus*, female ovipositor, drawn from the holotype. (x 25).

The dorsal thoracic bristles are disposed on each side of the median line as follows:—two superalar, and anterior to these there is a third but very weak bristle; the postalar are represented by three in the holotype and two in the paratype; about five dorsocentral; all these bristles are black. The two scutellar and the metapleural and hypopleural bristles are black.

The abdominal bristles are mostly black, but some white occur laterally. The ovipositor is short and compressed; the lamella is cylindrical, styliiform, and slightly longer than usual in the genus.

The legs have the anterior femora without spines; the intermediate femora have about four conspicuous black spines on the anterior side and one subapical spine on the posterior side; the posterior femora have about three subapical spines and a few black spines on the anterior side, and also a row of white, ventral, bristle-like spines.

The wings have a normal venation; the intermediate crossvein is situated at about two-thirds the length of the discal cell and the second posterior cell is rather short and slightly constricted subapically. Fuscous spots are present in the usual positions; one each at the apices of the marginal, first and second basal, and the discal cells, and also one at the cubital fork.

♂. The male is unknown.

Hab.—Western Australia: Armidale and Darlington, near Perth; King George's Sound.

Type.—The holotype, in the Australian Museum, was taken at Armidale on 1st October, 1912. The paratype is smaller and was taken at Darlington on 7th October, 1912.

Note.—Two female specimens, from King George's Sound, are in the Australian Museum collection, and agree with the type. This makes four specimens so far known, but it is probably quite a common species.

NEOITAMUS MISTIPES Macquart.

Asilus mistipes, Macquart, Dipt. Exot., suppl. 4, 1850, p. 94, Pl. 9, fig. 3 (wing).
Neoitamus graminis, White, Proc. Roy. Soc. Tas., 1913 (1914), p. 278; 1916, p. 179.

Rhabdotoitamus graminis, White, Proc. Roy. Soc. Tas., 1917, p. 99.

??*Neoitamus mistipes*, Ricardo, Ann. Mag. Nat. Hist., (8), xi., 1913, p. 433;
White, Proc. Roy. Soc. Tas., 1913, p. 275 (in key).

??*Rhabdotoitamus mistipes*, White, Proc. Roy. Soc. Tas., 1917, p. 100.

Synonymy.—*Asilus mistipes* Macquart is described from Tasmania, and the description agrees with White's *R. graminis*.

Miss Ricardo described a species from Mt. Gambier, South Australia, and referred it to Macquart's name. White overlooked Macquart's locality, and in his references he refers to Miss Ricardo's description only, using the locality given there. It is doubtful if Miss Ricardo's species is the same as Macquart's.

Unfortunately there is not a specimen of *R. graminis* White in the collection under revision, nor a specimen of *N. mistipes* Ricardo from South Australia, nevertheless the above synonymy appears to be convincing enough from a comparison of their respective descriptions.